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FEMALE MILITARY VETERANS AND TRAUMATIC STRESS

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Despite increasing interest in women in the military, the literature on female veterans and traumatic stress is surprisingly limited. This situation appears partly due to a lack of female veterans' public visibility and a corresponding failure to emphasize the scientific study of women in general. As a result of that climate, the earliest writings on female veterans and traumatic stress are largely personal recollections or clinical descriptions, typically by women who served in Vietnam. Today, as the scientific study of life trauma accelerates, investigators are increasingly conducting more empirical studies of traumatic stress in female veterans and examining in greater detail the spectrum of military stressors that may put women at-risk for problems in readjustment. This article reviews a number of the important papers on female veterans and traumatic stress. As with any newly emerging scientific field, some of the important writings on this topic are found in books and unpublished dissertations (e.g., Salvatore). The review concludes by suggesting some areas for future research.

Schnaier's (1986) dissertation was one of the earliest and most comprehensive examinations of women and war stress. Using 89 female Vietnam theater veterans, Schnaier administered an extensive questionnaire containing scales on exposure, symptomatology, and readjustment. Although formal diagnoses of PTSD were not made, the study showed that as many as 50% of participants experienced symptoms suggestive of PTSD, with at least 20% of the respondents feeling that symptoms were significantly disruptive. This study represented one of the first efforts to systematically identify and delineate traumatic war stressors in women, evaluating, for example, the experiences and effects of activities such as handling deaths and mutilations. Shortly after, Paul (1985) developed a questionnaire to investigate female veterans' distinctive war-time stressors and was able to identify a series of both event (i.e., war-zone) and personal (i.e., demographic) characteristics that, at least on a descriptive basis, were associated with poorer post-war adjustment in women Vietnam veterans including military service at a younger age, less military and professional experience, and occupational trauma (e.g., extensive exposure to death and dying). These factors were later confirmed by Baker et al. (1989). Like the preceding studies, Norman's (1988) inter-

views of 50 American nurses who served in Vietnam focused on the examination of outcome, stressor characteristics, and individual factors, notably the intensity of war-time stressors for noncombatants and the negative effect of limited post-war supports on subsequent adjustment. As with men, these experiences were related to the continuation of higher levels of intrusive and avoidant stress symptoms although overall rates of symptomatology declined over time.

The National Vietnam Veterans Readjustment Study (NVVRS; Kulka et al., 1990) was the first randomized, carefully controlled study to investigate the prevalence of PTSD and associated disorders in female theater veterans. This study had the benefit of specially designed psychometric instruments (e.g., the Mississippi Scale for Combat-Related PTSD) to corroborate interview data reflecting the presence of stress symptoms. When this study was completed, it essentially confirmed and extended prior descriptive studies on traumatic stress in female veterans, showing that although female Vietnam theater veterans had lower rates of PTSD than male combatants, women clearly suffered from the disorder in relation to the level of war-zone exposure. Furey (1991) reviews this and the preceding studies, and discusses some issues related to PTSD assessment in female veterans.

Another source relates more directly to treatment considerations including the effect of women's minority status within the military. Brende & Parson (1985) provide a discussion of the clinical implications of both female veterans' stressors and the adverse impact of minority status. Also included is a theoretical discussion of the differential effects of high and low magnitude stressors and the role of personal meaning and attribution in mediating women's adjustment to war stress. A number of treatment suggestions are made for dealing with issues of uniqueness, caretaking, and secrecy. Rothblum and Cole (1986) have edited an unusual compendium of writings by authors from a variety

Dr. Wolfe is the Acting Director of the Women's Health Sciences Division of the National Center for PTSD at the Boston VAMC. This Division has pioneered research on the psychological impact of military service on female veterans. Such initiatives include development of psychological and psychophysiological assessment techniques, large scale surveys of female Vietnam veterans, and Operation Desert Storm returnees. There has been a special emphasis on the impact of sexual assault and on the effect of PTSD on women's physical health.

of mental health orientations. The collection contains analyses on the traumatic exposure and painful psychological recovery of a female Vietnam theater veteran. A primary utility is their presentation of the need for a variety of treatment conceptualizations and approaches in dealing with traumatic stress in women. The importance of clinicians' appreciation for the impact of social mores on women's expression of traumatic experiences and the propensity for silence and maintenance of caretaking roles is also emphasized. The paper by Resick (1986) in this collection clearly describes the theory and practice of cognitive behavioral treatment of PTSD.

More recent empirical studies have focused on topics such as vocational readjustment, symptom expression (including suppression and intensification), and coping. In a distinctive study of the effects of women's active duty status on stress symptomatology, Stretch et al. (1985) showed that, despite clear-cut exposure, female active duty personnel had significantly less PTSD than their discharged veteran cohorts, suggesting that social support functioned as a substantial moderator of initial PTSD. Leon et al. (1990) studied coping patterns in female Vietnam and Vietnam-era veterans and found that despite greater psychological and interpersonal problems in the Vietnam theater women, coping that entailed more self-blame and a focus on negative affect and cognitions was significantly associated with poorer outcome, irrespective of war-time status. Besides providing the first empirical study of the process of coping and its effects in female veterans, the study offers preliminary data on the existence of military stressors among *era* females, a topic sometimes overlooked in the delineation of war trauma. In the first article on homeless female veterans, Leda et al. (1992) describe a small (1.6%) but noteworthy female subset of the current homeless veteran population. These women are likely to be younger, have lower rates of employment, and suffer from more serious mental illness (particularly mood disorders) than comparable males. Although rates of PTSD were not substantial, more comprehensive evaluation of diagnostic status is indicated. Finally, commensurate with the PTSD literature in male veterans, studies of female veterans now suggest a vulnerability for symptom intensification in women with prior war-time exposure. Wolfe et al. (1990) used PTSD-validated psychometric tests to examine the reactions of female Vietnam veterans to the onset of the Persian Gulf War. The authors found that many of these veterans experienced clinically significant intensification of stress symptoms following the start of the war, with the greatest symptom increases seen in individuals with previously documented PTSD.

Systematic studies of women's military and war-time exposure (rather than stress reactions) are still lacking. Dienstfrey (1988) offers a broad-based review of combat and war-zone exposure in female veterans across all eras, with the interesting finding that when traditional exposure parameters are used, World War II female veterans demonstrate the highest rates of combat exposure. A more recent paper by Wolfe et al. (in press) presents the psycho-

metric properties of a war-zone stressor scale for women which was able to identify empirically a variety of significant stressors ranging from hazardous occupational tasks to sexual assault.

All of these studies demonstrate the importance of continuing further research into traumatic stress in female veterans. Given the rates of victimization in our society, future studies will certainly need to consider the network of events encountered by female veterans and their potential additive or interactive effect across the life span.

SELECTED ABSTRACTS

BAKER, R.R., MENARD, S.W. & JOHNS, L.A. (1989). **The military nurse experience in Vietnam: Stress and impact.** *Journal of Clinical Psychology*, 45, 736-744. Demographic, health, and psychosocial data from two studies are presented on military nurses assigned to Vietnam. Army nurse subjects in the first study were grouped for comparison on three major variables: assignment to Vietnam before versus after the 1968 TET Offensive, type of nursing duties performed, and years of experience as a registered nurse (RN) prior to assignment in Vietnam. The second study compared another group of Army nurses with a group of Air Force and Navy nurses also assigned to Vietnam. Army nurses with less than two years RN experience prior to their assignment were found to be more at risk for such negative outcomes as difficulty establishing personal relationships and difficulty coping with stressful situations. Stress experiences, career dissatisfaction data, and health problems of military nurses and their children are reported. Also described are positive experiences of nurses in developing personal relationships in a rewarding professional environment.

BRENDE, J.O. & PARSON, E.R. (1985). **Special veteran groups: Women and the ethnic minorities.** In J.O. Brende & E.R. Parson (Eds.), *Vietnam veterans: The road to recovery* (pp. 125-165). New York: Plenum Press. Women and the ethnic minorities represent special populations of Americans who served in Southeast Asia during the Vietnam era. We refer to these groups as "special" because of the uniqueness of their readjustment needs, which have significant gender role and cultural elements. This uniqueness is based, essentially, on their marginal status in American society. Both female and ethnic minority veterans have had experiences in the military that differ in fundamental, qualitative ways from those of white male veterans.

DIENSTFREY, S.J. (1988). **Women veterans' exposure to combat.** *Armed Forces and Society*, 14, 549-558. Women veterans who were exposed to combat during their service were primarily Army nurses who served during World War II. Additional information presented is consistent with this conclusion. For example, those who were exposed to combat have a higher rate of post-secondary education and are more likely to be officers. Rates of combat exposure increase with age for each wartime period of service. The history of minority women in the military, and the career choices available to them prior to and during World War II, explains their relatively low rate of combat exposure. Like men, more women were exposed to combat in World War II than during either the Korean conflict or the Vietnam era. Other characteristics of women combat veterans — particularly higher postsecondary education, increased age, and a lower proportion of minority participants than noncombat-exposed female counterparts — stand in diametric contrast to what is perceived about men who have been exposed to combat.

FUREY, J.A. (1991). **Women Vietnam veterans: A comparison of studies.** *Journal of Psychosocial Nursing and Mental Health Services*, 29, 11-13. There is strong evidence that many women exposed to war stress have suffered mental health problems related to their experience, and a substantial number continue to have serious emotional, psychosocial, and other readjustment problems that affect their current level of functioning and life satisfaction. The consistent exposure to severe combat casualties, death and dying, workload extremes, personal deprivation, loss, and danger all take a significant emotional toll. These studies underscore the need for affected women to explore their war experiences and associated feelings with mental health professionals, as well as the need for those professionals to develop an awareness and understanding of the impact of specific war-related stress on women.

KULKA, R.A., SCHLENGER, W.E., FAIRBANK, J.A., HOUGH, R.L., JORDAN, B.K., MARMAR, C.R. & WEISS, D.S. (1990). **Trauma and the Vietnam War Generation: Report of findings from the National Vietnam Veterans Readjustment Study.** New York: Brunner/Mazel. Abstracted in *PTSD Research Quarterly*, 1(3), 1990.

LEDA, C., ROSENHECK, R. & GALLUP, P. (1992). **Mental illness among homeless female veterans.** *Hospital and Community Psychiatry*, 43, 1026-1028. This study examined sociodemographic and psychiatric diagnostic data from 19,313 veterans seen in the Department of Veterans Affairs Homeless Chronically Mental Ill (HCMI) Veterans Program from 1988 to 1991. It does not appear that women are disproportionately represented in the HCMI veterans program. Compared with the male group, a significantly larger proportion of homeless female veterans were diagnosed as having major psychiatric disorders, and a significantly smaller proportion had substance use diagnoses. The homeless women in our study appeared to be diagnostically similar to homeless female nonveterans. [Adapted from Text]

LEON, G.R., BEN-PORATH, Y.S. & HJEMBOE, S. (1990). **Coping patterns and current functioning in a group of Vietnam and Vietnam-era nurses.** *Journal of Social and Clinical Psychology*, 9, 334-353. A group of 36 nurses who served in Vietnam were compared with a group of 32 Vietnam-era military nurses on patterns of coping during their duty tours, the impact of their experiences, and current functioning. Coping patterns related to expressing feelings, seeking emotional support, and searching for meaning in the events experienced were associated with good present psychological functioning. The use of self-blame, withdrawal, and anxious thoughts as means of coping was related to current psychological dysfunction. There was a trend for a greater proportion of the Vietnam group to report continuing emotional and relationship problems later than one year after Vietnam service.

NORMAN, E.M. (1988). **Post-traumatic stress disorder in military nurses who served in Vietnam during the war years 1965-1973.** *Military Medicine*, 153, 238-242. Fifty nurses who served in Vietnam in the military were interviewed about their war experiences and the presence of PTSD. Results indicate that the number of nurses suffering from this disorder has decreased since the initial post-war years. Two variables: The intensity of the wartime experience, and supportive social networks after the war, influenced the level of PTSD.

PAUL, E.A. (1985). **Wounded healers: A summary of the Vietnam Nurse Veteran Project.** *Military Medicine*, 150, 571-576. The Vietnam Nurse Veteran Project was designed to identify stressors and after-effects experienced by nurses from the psychosocial milieu peculiar to the Vietnam War. The sample included 137 nurse veterans who completed a 52-item questionnaire designed by the author and a co-Investigator. Content analysis of the data identified eight specific stressors in the nurses' environment in Vietnam, such as: The young age and severity of the casualties, danger to the nurses' lives, sexual harassment, and survival guilt. Fourteen adverse after-effects were identified and affected more than one-third (39%) of the respondents. Some of the after-effects included: Nightmares, flashbacks, career problems, and physical or emotional problems. This study reveals that nurses, like combat veterans have suffered adverse after-effects from the Vietnam War, although the stressors of the war, for the nurses, were markedly different.

RESICK, P.A. (1986). **Post-traumatic stress disorder in a Vietnam nurse: Behavioral analysis of a case study.** In E.D. Rothblum & E. Cole (Eds.), *A woman's recovery from the trauma of war: Twelve responses from feminist therapists and activists* (pp. 55-65). New York: Haworth Press. (See below).

ROTHBLUM, E.D. & COLE, E. (1986). **A woman's recovery from the trauma of war: Twelve responses from feminist therapists and activists.** New York: Haworth Press (Also published as *Women & Therapy*, Volume 5, Number 1, Spring 1986). Contains twelve discussions of the case of "Ruth," a 39-year-old woman who served as a Navy nurse in Vietnam and was referred to a psychologist in private practice by a Veterans Administration Alcoholism Treatment Program. [Adapted from Text]

SALVATORE, M. (1992). **Women after war: Vietnam experiences and posttraumatic stress: Contributions to social adjustment problems of Red Cross workers and military nurses.** Unpublished doctoral dissertation, Simmons College School of Social Work, Boston. This study described the unique experiences and reactions of Red Cross workers and military nurses, exploring in particular the relationships between Vietnam experiences and PTSD symptoms and PTSD symptoms and later adjustment problems. The sample (n = 335) of 233 Red Cross workers and 102 military nurses responded to a mailed questionnaire. Measures for Vietnam experiences, PTSD symptoms, and demographic data were developed for this study. The CES-D scale for depressive symptoms and the Social Adjustment Scale were also utilized. Both groups suffered PTSD symptoms with nurses showing more short-term effects and more frequent nightmares and alcohol problems. In 1987 a third of the group reported depressive symptoms, PTSD symptoms, and vulnerability to social adjustment problems. PTSD symptoms contributed to social adjustment difficulties with mates, children, families, friends and work. [Abridged Abstract].

SCHNAIER, J.A. (1985). **A study of women Vietnam veterans and their mental health adjustment.** In C.R. Figley (Ed.), *Trauma and its wake. Vol. II: Traumatic stress theory, research, and intervention* (pp. 97-132). New York: Brunner/Mazel. Using a modified version of Wilson and Krauss's (1981) Vietnam-Era Stress Inventory, Schnaier studied 86 women veterans (primarily nurses attached to medical facilities located in Vietnam) to assess the nature and extent of the mental health problems affecting female veterans and if their traumatic stressors were similar to male veterans experiencing symptoms of PTSD. The author reported a significant correlation between the stressors identified and symptoms

associated with PTSD. The research revealed, among other things, evidence of current mental health distress among female veterans; personal and professional growth associated with war service; and significant differences with regard to biographic/demographic factors between male and female veterans. According to Schnaier, this latter finding emphasizes the need for further investigation of the female veteran population. She concludes the chapter with a discussion of the implications of the findings for treating women Vietnam veterans.

STRETCH, R.H., VAIL, J.D. & MALONEY, J.P. (1985). **Post-traumatic stress disorder among Army Nurse Corps Vietnam veterans.** *Journal of Consulting and Clinical Psychology*, 53, 704-708. Results are presented from an epidemiologic investigation of PTSD among Army nurse veterans [Vietnam Era Nurses Adjustment Survey]. Analysis of questionnaire data from more than 700 Vietnam and Vietnam-era veterans still on active duty in the U.S. Army Nurse Corps reveals a current PTSD rate for Vietnam veteran nurses of 3.3%. This rate is comparable to that found among nonnurse active duty Army Vietnam veterans (5.1%) and is much lower than estimates (18%-54%) for civilian Vietnam veterans. Results suggest that danger and exposure to violence may be responsible for stress reactions such as PTSD among noncombatants. Additional results indicate that social support is an important moderator in the attenuation of PTSD.

WOLFE, J., BROWN, P.J. & BUCSELA, M.L. (1992). **Symptom responses of female Vietnam veterans to Operation Desert Storm.** *American Journal of Psychiatry*, 149, 676-679. Objective: This study examined the status of symptoms of PTSD in a cohort of women after the onset of Operation Desert Storm. Method: Seventy-six non-treatment-seeking Vietnam veterans were obtained from lists of those who recently had participated in other research projects conducted at the National Center for Post-Traumatic Stress Disorder. Before the onset of Operation Desert Storm, subjects had completed a set of psychometrically valid instruments measuring general psychological symptoms and PTSD symptoms (e.g., SCL-90-R, Mississippi Scale for Combat-Related Posttraumatic Stress Disorder). On the basis of the latter scale, subjects were divided into groups with and without PTSD symptoms. At the height of the military conflict, subjects were recontacted and asked to complete the SCL-90-R and the Veterans Update Form, a measure assessing changes in PTSD symptoms. Results: Multivariate analyses indicated that while most female Vietnam veterans experienced some intensification of stress-related symptoms during Operation Desert Storm, those who had previously reported high levels of PTSD were significantly more susceptible to greater distress. Conclusions: Results of this survey indicate that female Vietnam veterans with prior wartime exposure are an at-risk population for the intensification of stress symptoms after the recurrence of a military conflict.

WOLFE, J., BROWN, P.J., FUREY, J. & LEVIN, K.B. (in press). **Development of a War-Time Stressor Scale for Women.** *Psychological Assessment: A Journal of Consulting and Clinical Psychology*. Prior research has demonstrated the importance of stressor measurement as a component of evaluating PTSD. Much of the work conducted in this area has focused on male combat veterans, resulting in the development of several combat exposure scales. The nature of war-zone exposure for women, however, has not been systematically addressed. This paper describes the development and preliminary psychometric analyses of the Women's War-Time Stressor Scale (WWSS) - an instrument designed to measure the self-report of war-time stressors by both theater and era veterans as well as civilian women who served in Vietnam.

Measurement of internal consistency, test-retest reliability, and construct validity points to the potential clinical and research utility of this type of instrument.

SLEEP DISTURBANCE IN POST-TRAUMATIC STRESS DISORDER

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This section of the *PTSD Research Quarterly* is devoted to the symptom most commonly reported by survivors of trauma, sleep disturbance. Notwithstanding the prominence of nightmares and impaired sleep initiation/maintenance in PTSD, the literature addressing them is small, major currents have yet to coalesce, and instances where one study has built upon another are rare. The study of sleep disturbance in PTSD is embedded, however, in an active network of disciplines concerned with such diverse topics as chronobiology, brainstem modulation of behavioral state, and cognitive treatment of nightmares. The following bibliography reflects some of this diversity.

Nightmares. Preeminent among topics within the field of sleep in PTSD is that of nightmares. A question of particular concern to researchers is whether PTSD-related nightmares arise out of REM sleep, NREM sleep, or both (Ross et al., 1989). Since baseline physiological parameters, and especially their dynamics, vary considerably across sleep states, preferential emergence of PTSD nightmares from one or the other could be informative. Contributing to continued uncertainty in this regard, however, is the intriguing fact that nightmares occur only rarely in the sleep laboratory (Hartmann, 1984). Nevertheless, sketchy direct and indirect data bearing on this question can be found (Kramer et al., 1984; Lavie et al., 1979; Ross et al., 1990; van der Kolk et al., 1984; Woodward et al., 1991a,b).

A closely related (some would say, equivalent) question is whether PTSD nightmares more closely resemble episodes of dream anxiety (definitionally REM-based), or night terrors (also termed *pavor nocturnus*, a slow wave sleep phenomenon observed principally in children). Fisher et al. (1970) have provided vivid descriptions of adult night terror and REM nightmare episodes with accompanying psychophysiology in normals. Also pertinent is the distinction between acquired PTSD nightmare disturbance and "lifelong" dream anxiety (see van der Kolk et al., 1984). Continuities have been examined between PTSD nightmares and nocturnal panic attacks (Hauri et al., 1989; see also Mellman & Uhde, 1989a,b), and REM behavior disorder (Ross et al., 1990). Finally, Kaminer and Lavie (1991) have reported dramatically reduced dream recall associated with successful post-trauma adjustment in a sample of Holocaust survivors.

Beyond Nightmares. To date, sleep researchers in PTSD have focused on features of sleep architecture which have dominated the existing literature on sleep and psychopathology, REM latency and slow wave sleep. Regarding both, the PTSD sleep literature is self-contradictory. The

latency of REM sleep in PTSD has been reported to be both reduced (Greenberg et al., 1972; Kauffman et al., 1987), and increased (Glaubman et al., 1990; Hefez et al., 1987; Lavie et al., 1979). Slow wave sleep has been reported to be reduced (Glaubman et al., 1990; Kramer et al., 1984), increased (Dagan et al., 1991), and normal (Hefez et al., 1987; Lavie et al., 1979). Interestingly, both cholinergic (Hobson & Steriade, 1986) and noradrenergic (Siegel & Rogawski, 1988) perspectives on REM sleep would seem to converge on a prediction that REM 'pressure' would be increased and REM latency reduced in PTSD.

Other currents in basic sleep research may prove important to the study of sleep in PTSD. One such area is the study of cognitive activity during sleep. Normals can respond to auditory stimuli from all stages of sleep with little modification of sleep architecture. Frequent anecdotal reports from combat-related PTSD patients suggest continuous heightened awareness of the sleeping environment and hair-trigger arousability. Interestingly, there is evidence that combat veterans with PTSD have *elevated* arousal thresholds under certain conditions (Dagan et al., 1991; Schoen et al., 1984).

Treatment Studies. Though there is empirical support for common notion that sleep loss results in performance failures, and reason to suspect that motor vehicle accidents have caused a disproportionate number of deaths in Vietnam combat veterans (CDC, 1987), causative links have yet to be established between sleep disturbance and accidents, medical disease, and/or dysfunction in PTSD patients. Nevertheless, patients' dysphoria associated with sleep complaints (Inman et al., 1990) has motivated efforts to treat sleep loss in this group. The small literature concerned with the treatment of sleep disturbances in PTSD has focused almost exclusively upon the reduction of traumatic nightmare frequency, and consists largely of single-case studies employing systematic desensitization or imaginal flooding. The study of Cooper and Clum (1989) represents a significant methodological advance in this area. Controlled studies of therapeutic agents for PTSD sleep disturbance have yet to be performed. Nevertheless, the reader may be interested in two brief multiple-case reports using imipramine (Marshall, 1975) and cyproheptadine (Brophy, 1991).

In conclusion, research on sleep disturbance in PTSD stands to benefit from the addition of new methods, larger well-defined subject groups, and liberal exploration of domains outside the current mainstream of sleep in psychopathology.

SELECTED ABSTRACTS

BROPHY, M.H. (1991). **Cyproheptadine for combat nightmares in post-traumatic stress disorder and dream anxiety disorder.** *Military Medicine*, 156, 100-101. Pharmacologic treatment of patients with PTSD often involves antidepressant drugs. Combat nightmares often persist. The addition of cyproheptadine, in a median dose of 16-24 mg orally at night, controls the nightmares.

COOPER, N.A. & CLUM, G.A. (1989). **Imaginal flooding as a supplementary treatment for PTSD in combat veterans: A controlled study.** *Behavior Therapy*, 20, 381-391. The present study examined the incremental effectiveness of imaginal flooding (IF) over standard psychotherapeutic and pharmacologic approaches in the treatment of combat-related PTSD. Evidence was found supportive of IF's effectiveness with regard to self-report symptoms directly related to the traumatic event(s), state anxiety, subjective anxiety in response to traumatic stimuli, and sleep disturbance. Flooding had no effect on level of depression or trait anxiety, indicating that it is a useful adjunctive treatment for PTSD but cannot likely be used as the sole vehicle of change.

DAGAN, Y., LAVIE, P. & BLEICH, A. (1991). **Elevated awakening thresholds in sleep stage 3-4 in war-related post-traumatic stress disorder.** *Biological Psychiatry*, 30, 618-622. Awakening thresholds from sleep stage 3/4 were investigated in 19 DSM-III-defined, war-related PTSD patients compared with 6 normal controls. Patients had significantly higher awakening thresholds and significantly longer latencies to an arousal response than controls. These results are interpreted to suggest modifications in the depth of sleep as one of the long-term sequelae of traumatic events.

GLAUBMAN, H., MIKULINCER, M., PORAT, A., WASSERMAN, O. & BIRGER, M. (1990). **Sleep of chronic post-traumatic patients.** *Journal of Traumatic Stress*, 3, 255-263. The purpose of the present study was to investigate the sleep of people diagnosed as suffering from chronic PTSD. The sleep of seven chronic post-traumatic patients with no known physical injuries was compared with that of seven matched control subjects. The post-traumatic patients had poorer sleep: decreased sleep efficiency, increase in number of awakenings, and decreased SWS, as well as longer REM latency. It was also found that their complaints correlated with relevant sleep-monitored measures.

GREENBERG, R., PEARLMAN, C.A. & GAMPEL, D. (1972). **War neuroses and the adaptive function of REM sleep.** *British Journal of Medical Psychology*, 45, 27-33. This study deals with the relationship between the psychological state of a number of patients with war neuroses and the development of REM sleep. Beginning with the hypothesis that REM sleep is involved in the process of handling and integrating stressful experiences, we developed a method of assessing a patient's psychological state at the time of the sleep study in order to correlate psychological state with sleep recordings. Using our approach, we have been able to demonstrate a clear relationship between specific psychodynamic events in a patient and the physiological concomitants of dreaming, most striking in relation to pressure to dream as measured by REM latency. [Adapted from Text]

HEFEZ, A., METZ, L. & LAVIE, P. (1987). **Long-term effects of extreme situational stress on sleep and dreaming.** *American Journal of Psychiatry*, 144, 344-347. Sleep data were obtained on 11 patients who had survived traumatic events and who complained of sleep disturbances. Each was awakened from REM and non-REM sleep for dream recall. The patients had lower sleep efficiency indices (because of prolonged sleep latency and larger amounts of "awake" plus "movement" time within sleep periods), shorter REM time, and longer REM latencies than did control subjects. Four of the 11 patients had REM- and non-REM-related nightmares, which, in two sea disaster patients, were associated with REM-related motor activity. The rest of the patients had unusually low dream recall in spite of high eye movement density.

INMAN, D.J., SILVER, S.M. & DOGHRAMJI, K. (1990). **Sleep disturbance in post-traumatic stress disorder: A comparison with non-PTSD insomnia.** *Journal of Traumatic Stress*, 3, 429-437. Sleep disturbances, including repetitive nightmares and insomnia, are central and long-lasting aspects of PTSD. This study utilized a questionnaire to compare sleep disturbance in Vietnam war combat veterans having PTSD with non-PTSD patients having insomnia without other PTSD symptoms. The PTSD group reported symptoms of anxiety, agitation, and concurrent body movement, which were associated with insomnia. Nightmares of this group were more repetitive and more disruptive of a return to sleep than the non-PTSD insomnia group. The PTSD group also reported more fatigue during daytime functioning and more anxiety during waking hours than the non-PTSD insomnia group.

KAMINER, H. & LAVIE, P. (1991). **Sleep and dreaming in Holocaust survivors: Dramatic decrease in dream recall in well-adjusted survivors.** *Journal of Nervous and Mental Disease*, 179, 664-669. Sleep data were obtained on 12 well-adjusted and 11 less-adjusted Holocaust survivors and on 10 control subjects. Each was also awakened from rapid eye movement sleep for dream recall. The less-adjusted survivors had more prolonged sleep latency than the well-adjusted and the control groups and lower sleep efficiency than the control subjects. The well-adjusted group had a significantly lower dream recall rate (33.7 percent) than the less-adjusted (50.5 percent) and control groups (80 percent). There were also significant between-groups differences in dream structure and dream content, in the direction of less complex and less salient dreams in the well-adjusted survivors. It is suggested that the decrease in dream recall is one of the forms of long-term adjustment to severe traumatic events.

KAUFFMAN, C.D., REIST, C., DJENDEREDJIAN, A., NELSON, J.N. & HAIER, R.J. (1987). **Biological markers of affective disorders and post-traumatic stress disorder: A pilot study with desipramine.** *Journal of Clinical Psychiatry*, 48, 366-367. Three biological markers of affective disorders and response to desipramine were used to study the relationship of PTSD to affective illness. Blunted TRH response and decreased REM latency in eight patients with PTSD occurred at frequencies similar to those that have been found in patients with major affective disorder. Pretreatment Hamilton Rating Scale for Depression and Beck Depression Inventory scale scores were elevated; scores after 4 weeks' treatment with desipramine revealed significant ($p < .05$ and $p < .005$, respectively) improvement. These findings support a link between PTSD and affective illness.

KRAMER, M., SCHOEN, L.S. & KINNEY, L. (1984). **The dream experience in dream-disturbed Vietnam veterans.** In B.A. van der Kolk (Ed.), *Post-traumatic stress disorder: Psychological and biological sequelae* (pp. 81-95). Washington, D.C.: American Psychiatric Press. Compared Vietnam combat veterans with and without nightmare complaints. Those without nightmares had to endorse at least one other symptom of PTSD. Reduced REM percent (18%) was observed in both groups. Content of mentation was obtained from experimenter-initiated awakenings from REM and NREM sleep. Nightmare sufferers included Vietnam-related content in 47% of dream reports, while the comparable figure for controls was only 4%. Within nightmare sufferers, Vietnam-related content was not preferentially associated with REM vs. NREM awakenings. [SHW]

LAVIE, P., HEFEZ, A., HALPERIN, G. & ENOCH, D. (1979). **Long-term effects of traumatic war-related events on sleep.** *American Journal of Psychiatry*, 136, 175-178. 11 patients who had combat neuroses resulting from the 1973 Yom Kippur War and complained of sleep disturbances were studied in a sleep laboratory. Sleep-onset insomniacs, dream-interruption insomniacs, and pseudosomniacs were differentiated on the basis of electrophysiologic recordings. Compared with normal controls who actively participated in the Yom Kippur War, patients showed significantly longer sleep latencies, lower sleep efficiency indices, lower percentage of REM sleep, and longer REM latencies.

MARSHALL, J.R. (1975). **The treatment of night terrors associated with the posttraumatic syndrome.** *American Journal of Psychiatry*, 132, 293-295. The author describes three cases in which the frequency and intensity of night terrors associated with the posttraumatic syndrome were greatly lessened by administration of imipramine; in one case, the night terrors disappeared completely. Possible explanation for this effect of imipramine are discussed, including the drug's arousal-preventing action. The author believes that the study of sleep EEGs of patients suffering posttraumatic syndrome will prove fruitful.

ROSS, R.J., BALL, W.A., DINGES, D.F., MULVANEY, F.D., KRIBBS, N.R., MORRISON, A.R. & SILVER, S.M. **Motor activation during REM sleep in posttraumatic stress disorder.** *Sleep Research* 1990, 19, 175. While most studies find excessive movement in the sleep of PTSD patients, especially during nightmares, REM sleep is normally associated with atonia. These investigators performed polysomnography, with special emphasis on recording and quantification of leg EMG, on 11 PTSD patients and 6 controls. The authors found that in PTSD patients 4.6% of REM epochs included phasic EMG, while for controls, this figure was only 1.3% ($p < 0.05$). NREM periodic leg movements were also more frequent in the PTSD patients (11 per hour vs. 1 per hour, $p < 0.01$). These findings were consistent with a generalized motor dyscontrol syndrome. Its association with REM sleep or even sleep, per se, remained equivocal. The authors went on to note, however, the presence of periodic leg movements, in particular, distinguished the PTSD patients from depressed patients, in whom such movements have generally not been observed. [SHW]

ROSS, R.J., BALL, W.A., SULLIVAN, K.A. & CAROFF, S.N. (1989). **Sleep disturbance as the hallmark of posttraumatic stress disorder.** *American Journal of Psychiatry*, 146, 697-707. Cited in *PTSD Research Quarterly*, 1(1), 1990.

SCHOEN, L., KRAMER, M. & KINNEY, L. (1984). **Auditory thresholds in the dream disturbed.** *Sleep Research*, 13, 102. Studied 16 Vietnam combat veterans: 8 qualified as "dream disturbed" by demonstrating lab nightmares (NREM \geq REM); 8 qualified as controls by reporting no nightmare complaints. The dream disturbed veterans were more responsive than controls to supra-threshold stimuli during sleep. This finding held for respiration and gross motor responses, not heart rate or chin EMG, and reached significance only during NREM sleep. As in other arousal studies thresholds were generally lower in REM and generally lower later in the night; however, in apparent contradiction to this finding, the dream disturbed veterans demonstrated significantly elevated thresholds to arousal stimuli in an ascending limits protocol. This held for both REM and NREM sleep but seemed especially prominent in early REM. [SHW]

VAN DER KOLK, B.A., BLITZ, R., BURR, W.A., SHERRY, S. & HARTMANN, E. (1984). **Nightmares and trauma: A comparison of nightmares after combat with lifelong nightmares in veterans.** *American Journal of Psychiatry*, 141, 187-190. In this study the chronic traumatic nightmares of men who had been in combat were found to differ from the lifelong nightmares of veterans with no combat experience in that they tended to occur earlier in the sleep cycle, were more likely to be replicas of actual events, and were more commonly accompanied by gross body movements. Traumatic nightmares may arise out of varying stages of sleep and are not confined to REM sleep alone. The group with lifelong nightmares showed evidence of thought disorder on the Rorschach. The men with PTSD had failed to psychologically integrate their traumatic experiences and used dissociation as a way of dealing with strong affects.

WOODWARD, S.H., ARSENAULT, N., BLIWISE, D.L. & GUSMAN, D.F. (1991a). **Physical symptoms accompanying dream reports in combat veterans.** *Sleep Research*, 19, 153. Five nights of self-report data consisting of awakening times, dream types, and physical symptom(s), were collected from 18 Vietnam combat veterans enrolled in a post-traumatic stress disorder (PTSD) inpatient treatment program. Self-reports were made when subjects awoke spontaneously and judged that they would remain awake for some time. Sweating reports were associated almost exclusively with awakenings on which Vietnam nightmares were also reported. Tachycardia reports were associated with awakenings including reports of all dream types; furthermore, in later sleep cycles, tachycardia reports were associated with Vietnam and non-Vietnam nightmares at similar rates. However, early in the night, tachycardia reports were specific to awakenings including Vietnam nightmare reports. These data are generally in accord with the established link between dream content and physiologic arousal in normal volunteers.

WOODWARD, S.H., ARSENAULT, N., BLIWISE, D.L. & GUSMAN, D.F. (1991b). **The temporal distribution of combat nightmares in Vietnam combat veterans.** *Sleep Research*, 19, 152. Five nights of self-report data consisting of awakening times, dream types, and physical symptom(s), were collected from 18 Vietnam combat veterans enrolled in a post-traumatic stress disorder (PTSD) inpatient treatment program. "Vietnam" nightmares exhibited an increase in frequency early in the night. In contrast, the distribution of non-Vietnam nightmares and pleasant dreams appeared consistent with the normative distribution of REM time. Expressed as a proportion of "normal" dreams, the frequency of "Vietnam" nightmares decreased monotonically after the initial burst. These data reinforce earlier suggestions that the early sleep cycles deserve special attention in polysomnographic studies of PTSD.

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PTSD RESEARCH AT THE ST. CLOUD VAMC

Charles G. Watson, PhD

The St. Cloud PTSD research program has concentrated on the description of PTSD, its measurement, and its risk factors.

Definition and Description of PTSD. PTSD research at St. Cloud began in the early 1980s with efforts to identify the symptoms of the disorder. In an early study, Melodie Van Kampen and I examined the correlations of each DSM-III PTSD symptom with eligibility for a PTSD diagnosis. Our results suggested that the most characteristic symptoms of PTSD are those dealing with reexperiencing of the trauma. In contrast, some other items (e.g., survival guilt, concentration problems) did not correlate significantly with eligibility for PTSD diagnosis, suggesting that they might be deleted from the diagnostic manual. In a second study, we compared PTSD symptom self-ratings of patients reporting delayed and undelayed onsets. They did not differ, which argued against categorizing delayed- and undelayed-onset PTSD as separate subtypes, as had been done in DSM-III. In a third study, Douglas Anderson and I factor analyzed the DSM-III symptoms, hoping to determine how they might best be categorized in future DSM editions. The findings (separate Intrusive Thoughts, Arousal, Impoverished Relationships, Guilt, and Cognitive Interference factors) gave more support to the DSM-III-R system than to earlier ones, but suggested additional changes as well.

In a current study, Mark Juba and I are attempting to identify the specific characteristics (e.g. baseline, length of response, peak amplitude, acceleration and deceleration rates, etc.) of the physiological hyperarousal found in PTSD.

Psychometrics. Our primary effort in this area has been the development of the Posttraumatic Stress Disorder Interview (PTSD-I). It consists of 177-point self-ratings closely reflecting DSM-III-R standards. It generates both binary present/absent and continuous severity outputs for each symptom and for the entire disorder. It offers high test-retest reliability, internal consistency, and validity.

We reviewed the empirical literature on the strengths and weaknesses of 12 PTSD measures in a 1990 article. Those with the most encouraging validities were our PTSD Interview (PTSD-I), the Structured Clinical Interview for DSM-III-R PTSD module, and Keane et al.'s Mississippi Scale. In a subsequent comparative validation, we also found the PTSD-I and Mississippi Scale offered better validity than the Diagnostic Interview Schedule PTSD module or the Keane et al. MMPI PTSD scale.

Risk Factors. The primary focus in our current research is the identification of factors influencing risk for PTSD after trauma exposure. Like other studies, our results suggest that rebellious adolescent behavior, such as drinking and conflict with authority, does not predict PTSD. Nor did self-reports of childhood PTSD-like behaviors (such as nightmares, social withdrawal, or easy startle) predict

later PTSD. Patricia Thienes-Hontos and I also found PTSD symptoms reported with equal frequency in the files of Vietnam veterans entering our hospital in the 1970s and in those of Korean War patients treated here in the 1950s. This suggested that the peculiar circumstances surrounding the Vietnam War may not have contributed to PTSD risk, contrary to popular folklore. Additionally, Rev. Gary Berg, our Chaplain Service Chief, has produced evidence that high moral development is associated with a dampening of PTSD's symptoms after exposure to severe trauma. We have also studied the effects of stresses which occur before trauma on risk for PTSD in two studies. The results of the first suggested that exposure to stress leads to a psychological "vaccination" which reduces the ability of a later trauma to cause PTSD. However, our second study yielded negative results and failed to confirm this finding.

In our current Merit Review program, Butch Nugent and I are studying the relationship of PTSD to each of 45 other disorders in a large help-seeking population. We are also collecting data on the sequence in which trauma, PTSD, and comorbid disorders develop. This may help identify the effects that trauma, PTSD, and other conditions have on one another.

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